

Organics Recycling Trends In The U.S. and Internationally

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Massachusetts Organics Summit
Boxborough, Massachusetts
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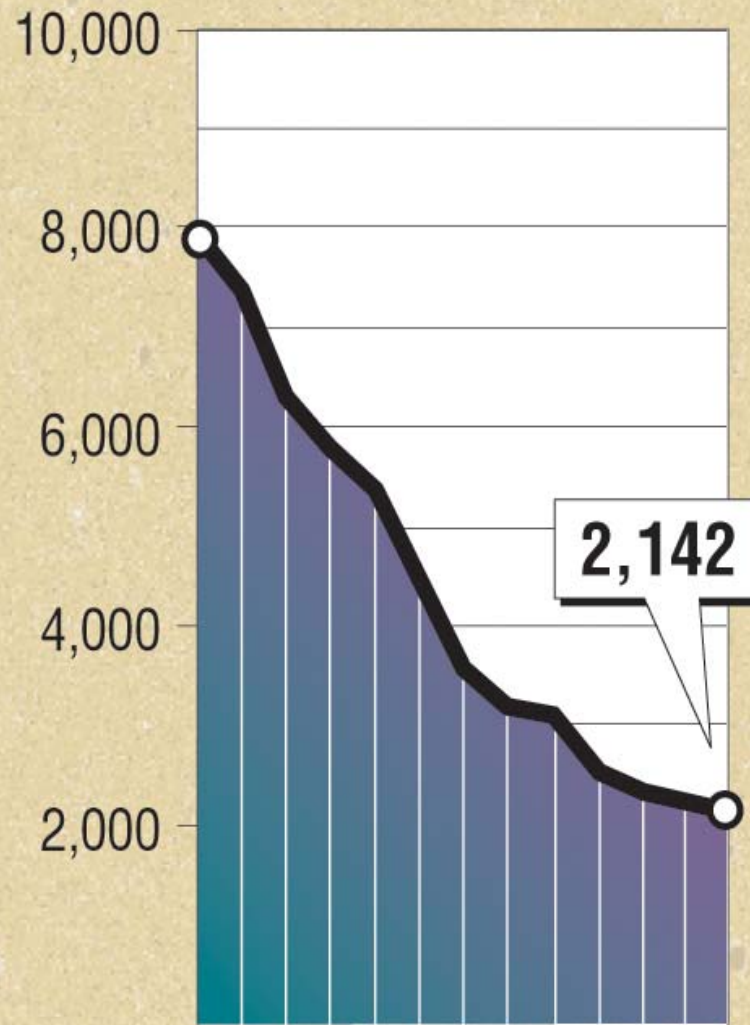
Composting Evolution

- Sum up to say it's been an endurance test with many winners and many losers
- Mixed waste composting
- Source separated composting
- Composting methods for specific feedstocks
- Learned A LOT!!!!!!

Composting Today

- Have emerged from the battle scarred but equipped to compost
- No good excuse for poorly run composting facility
- Know how to and MUST produce quality compost consistently. That is critical!!!
- Have hit a wall for the time being, and probably in the next few years with solid waste management

Landfills



1988

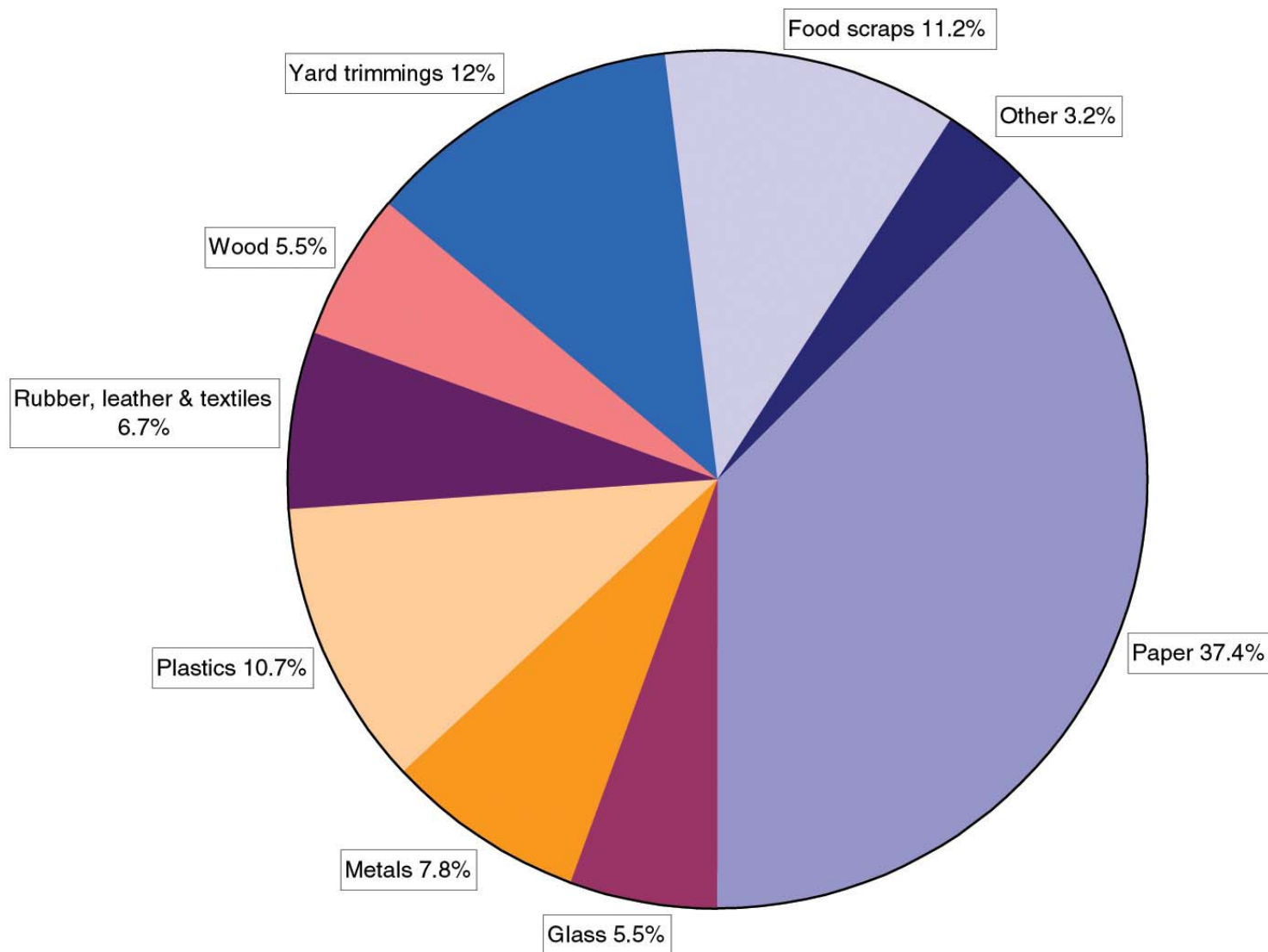
Source: BioCycle

Table 1. State of Garbage in America survey data 1990–2001 — MSW tonnages, recycling, incineration and landfill rates

<i>Survey Year</i>	<i>Total MSW Generated (tons/yr)</i>	<i>Recycled¹ (%)</i>	<i>Incinerated (%)</i>	<i>Landfilled (%)</i>
1990	269,000,000	8	8	84
1991	293,613,000	11.5	11.5	77
1992	280,675,000	14	10	76
1993	291,742,000	17	11	72
1994	306,866,000	19	10	71
1995	322,879,000	23	10	67
1996	326,709,000	27	10	63
1997	327,460,000	28	10	62
1998	340,466,000	30	9	61
1999	374,631,000	31.5	7.5	61
2000	382,594,000	33	7	60
2001 ²	409,029,000	32	7	61

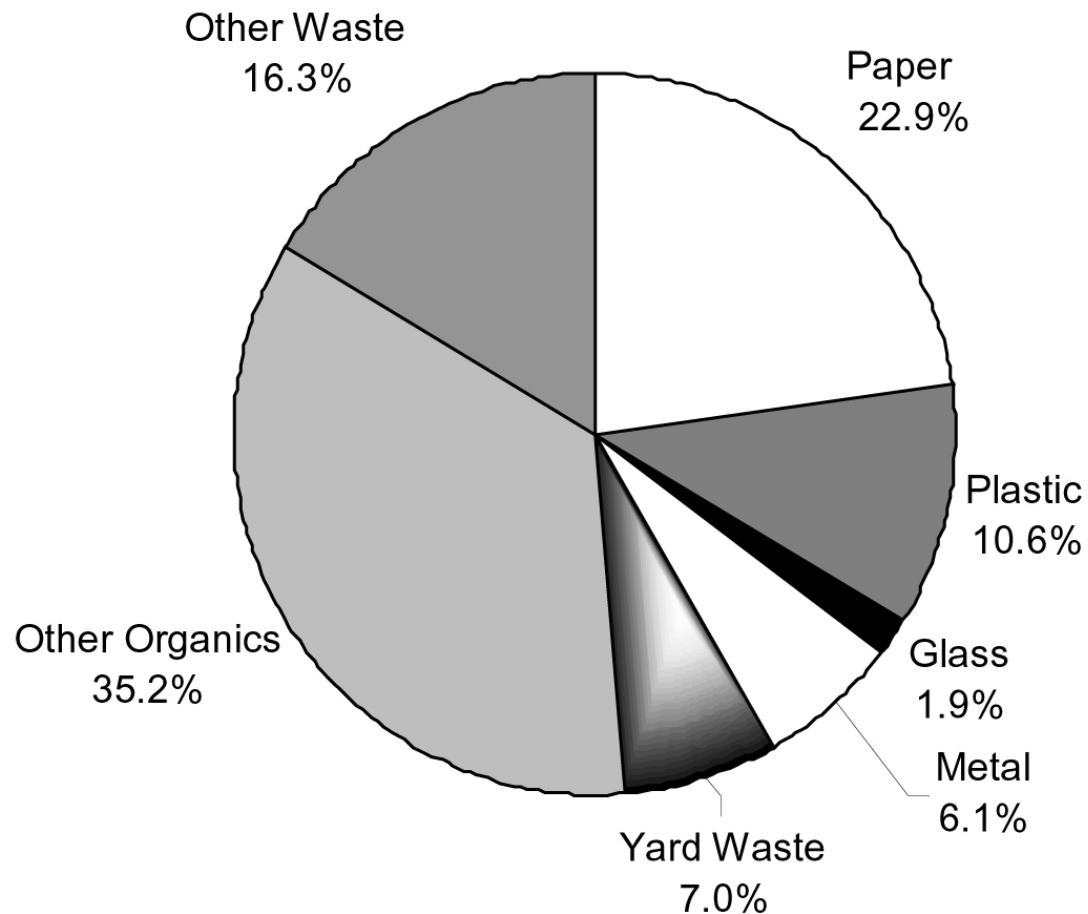
¹Includes yard trimmings composting; ²Four states did not provide recycled, incinerated and landfilled percentages. MSW amounts for those states are included.

**Figure ES-3: 2000 Total MSW Generation - 232 Million Tons
(Before Recycling)**

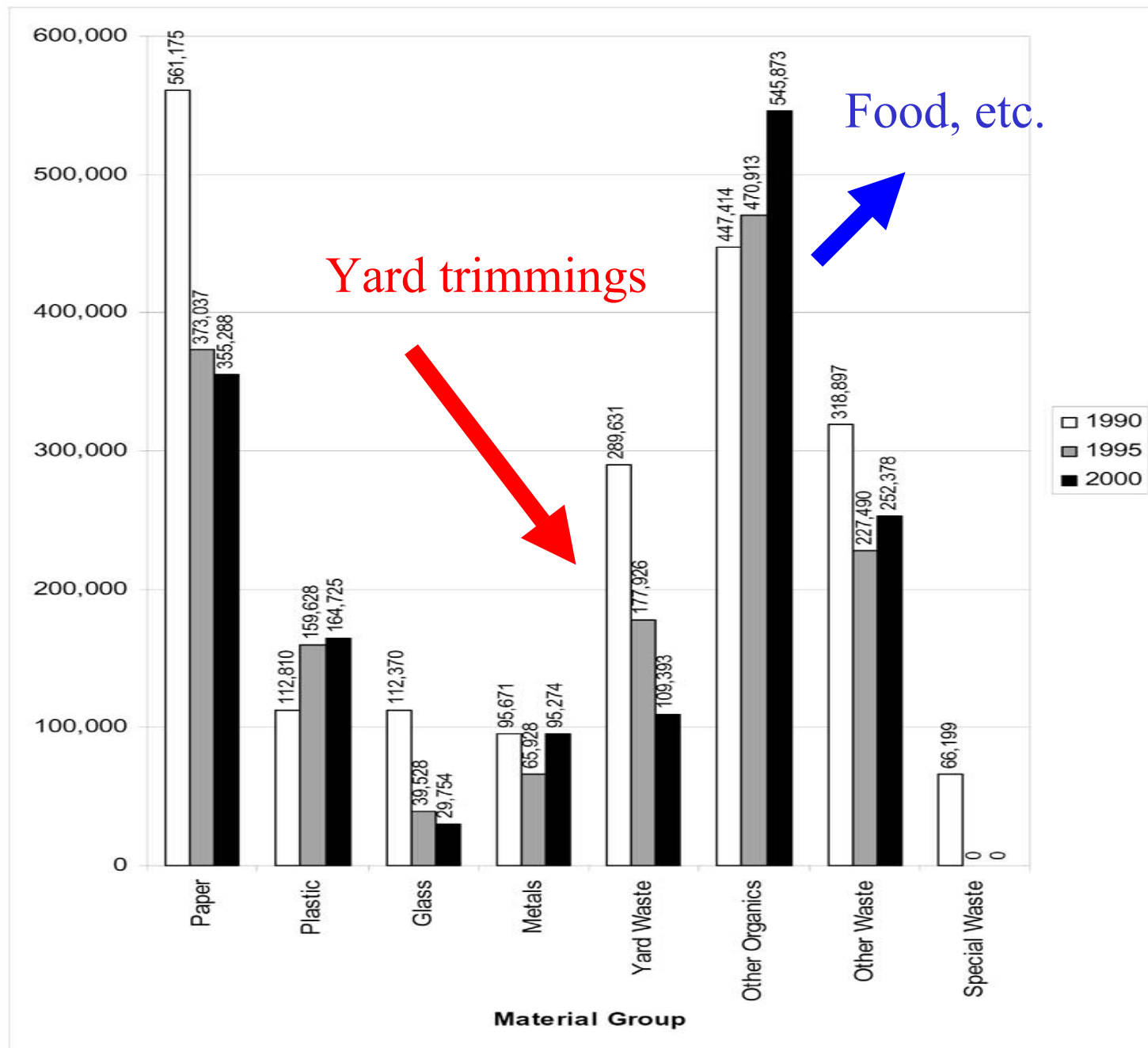


Residuals are there for the taking

2000 Alameda County Aggregate Waste Composition by Major Material Group



Comparison of 2000, 1995, and 1990 Aggregate Composition by Material Group (Tons)¹



¹ See footnote to Table ES.10 for more information about comparing results from these three studies.

2003 & Forward:

What are the organics residuals diversion
“drivers?”

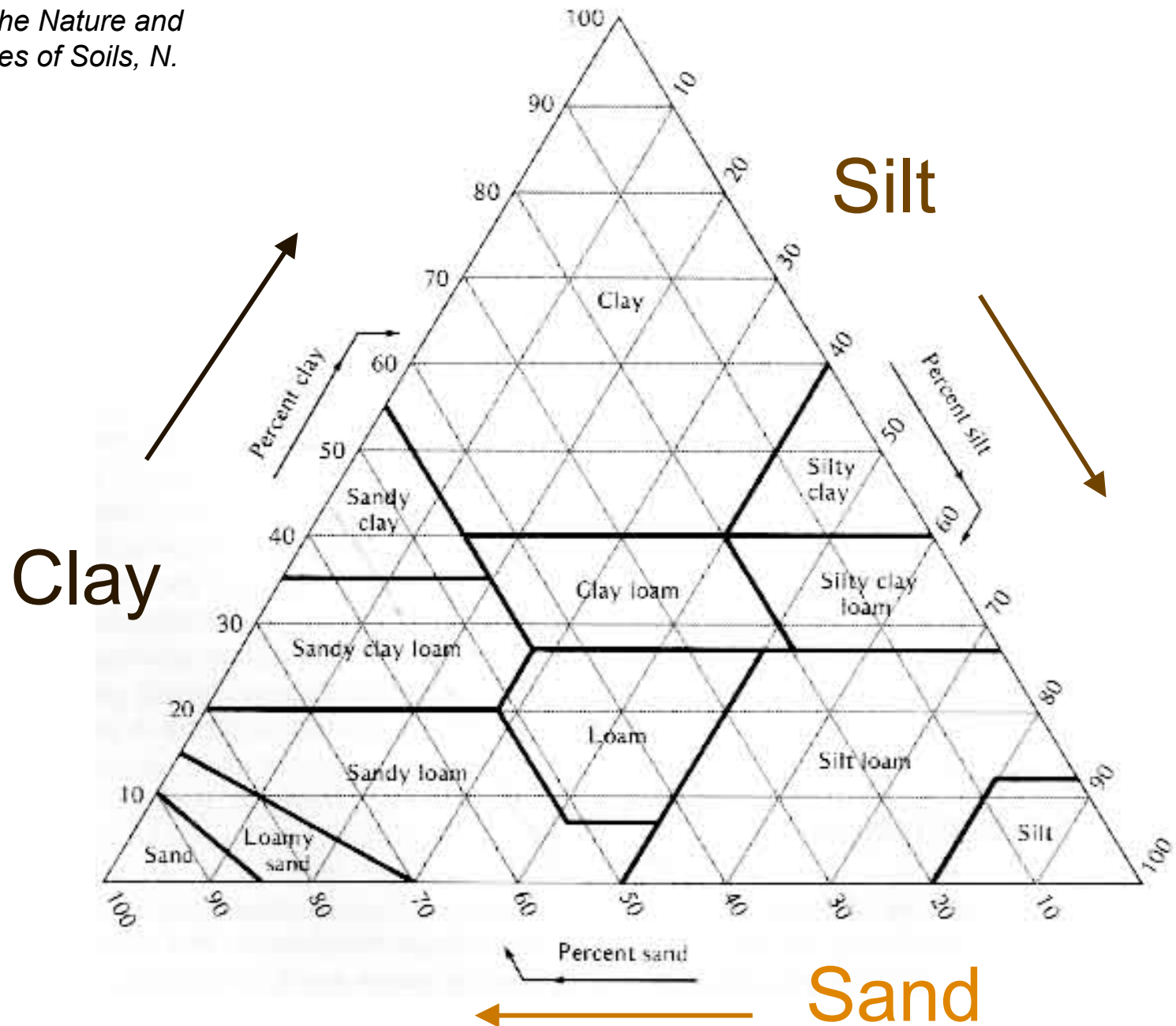
**Transition From Waste Management
To Environmental Problem-Solving**

Laundry List of Environmental Problems

- Drought
- Water Quality Overall
- Soil Loss, Soil Infertility
- Sediment
- Excess Nutrients
- Global Climate Change
- Dependence on fossil fuels
- Contaminated Soils

- Drought: 40% of the United States in drought conditions right now
- Water:
 - Limited supply of fresh water around the globe.
 - Water is predicted to be one of the key factors limiting growth in the 21st century
 - Sediment, untreated sewage, agricultural runoff are key pollutants globally
- Sediment:
 - Main pollutant of concern in storm water discharges.
 - Runoff rates from construction sites typically 10 to 20 times greater than from ag land.
 - Construction sites can contribute more sediment to streams in short period of time than can be deposited naturally during several decades” (U.S. EPA)

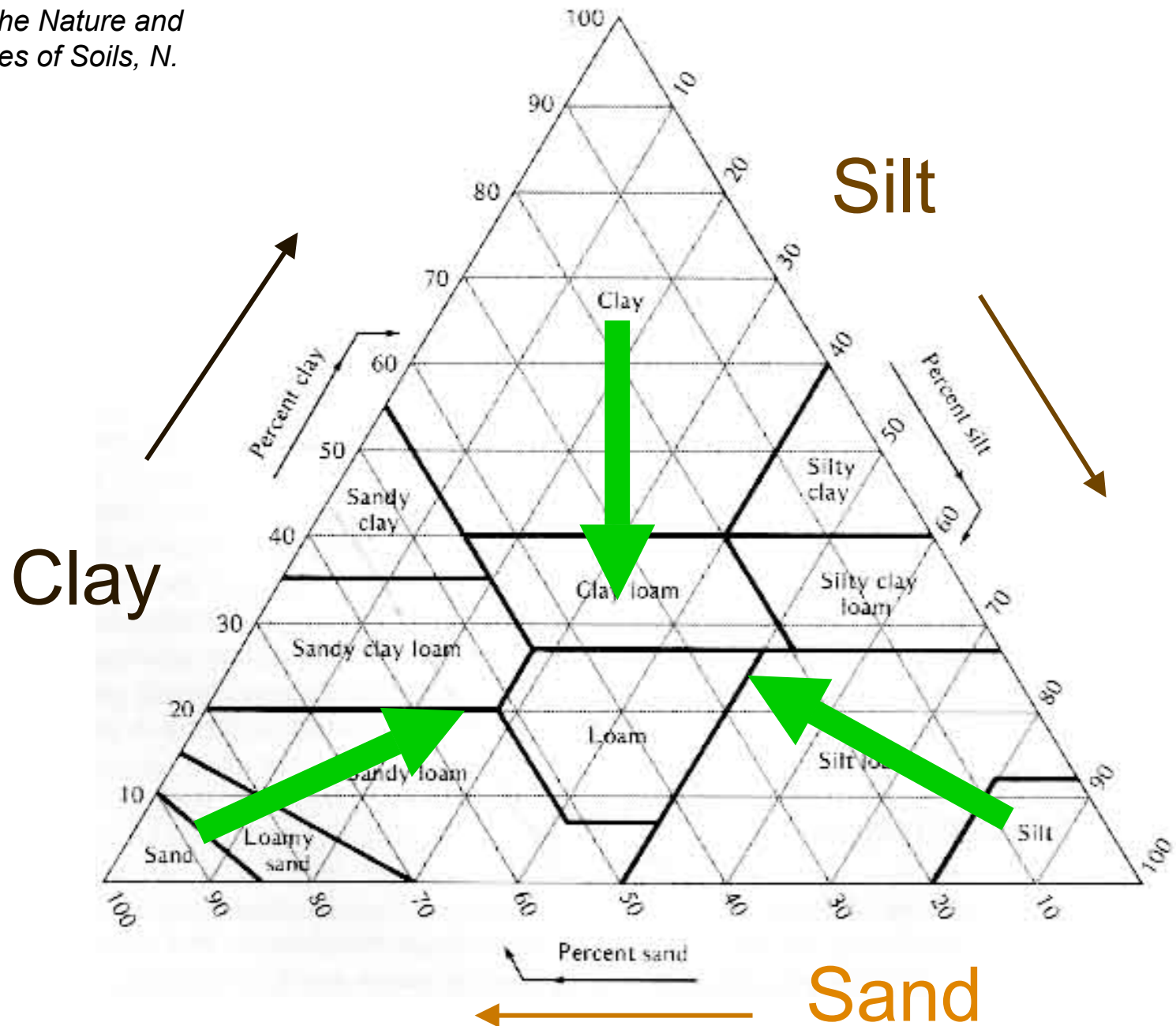
From: *The Nature and Properties of Soils*, N. Brady

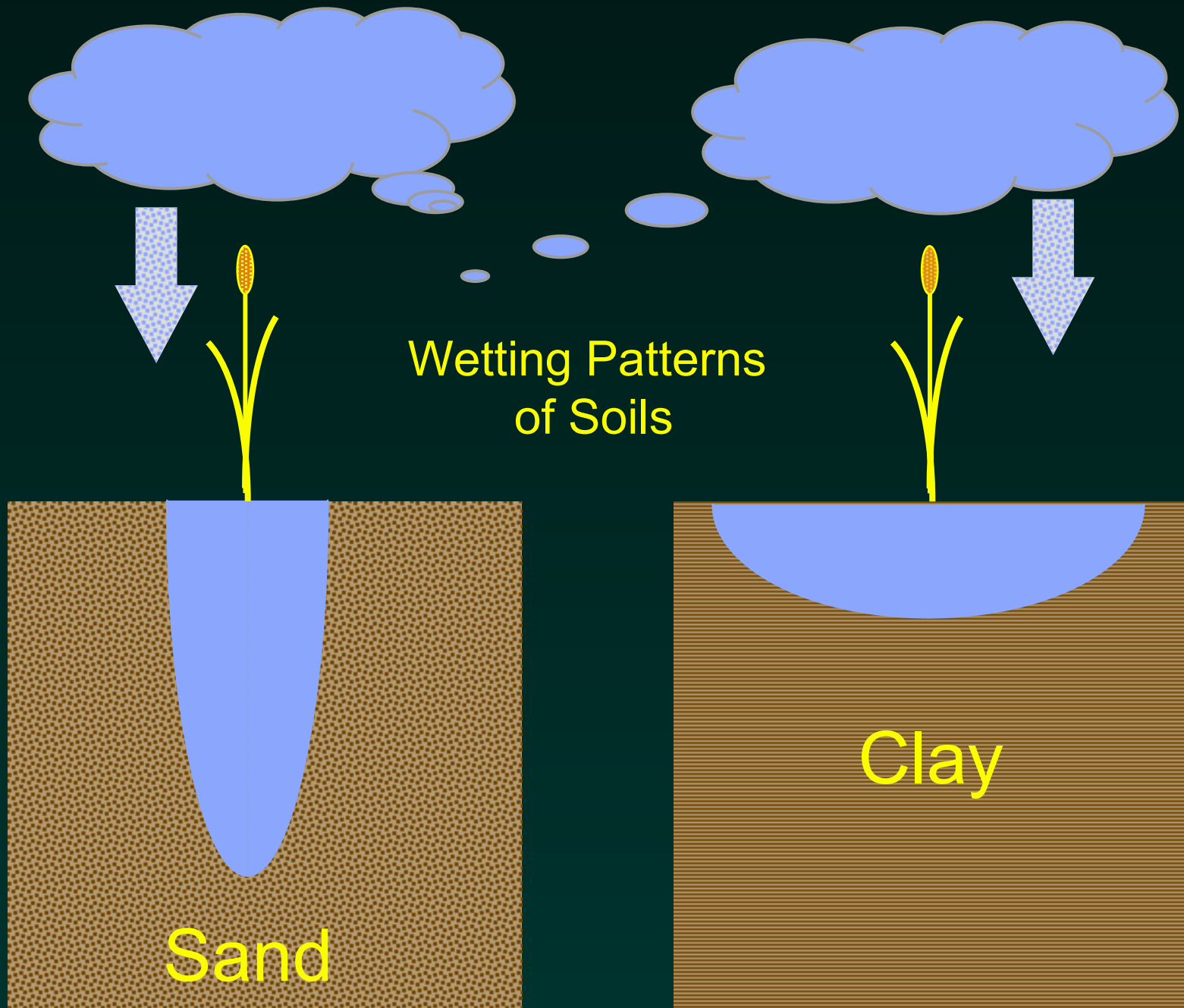


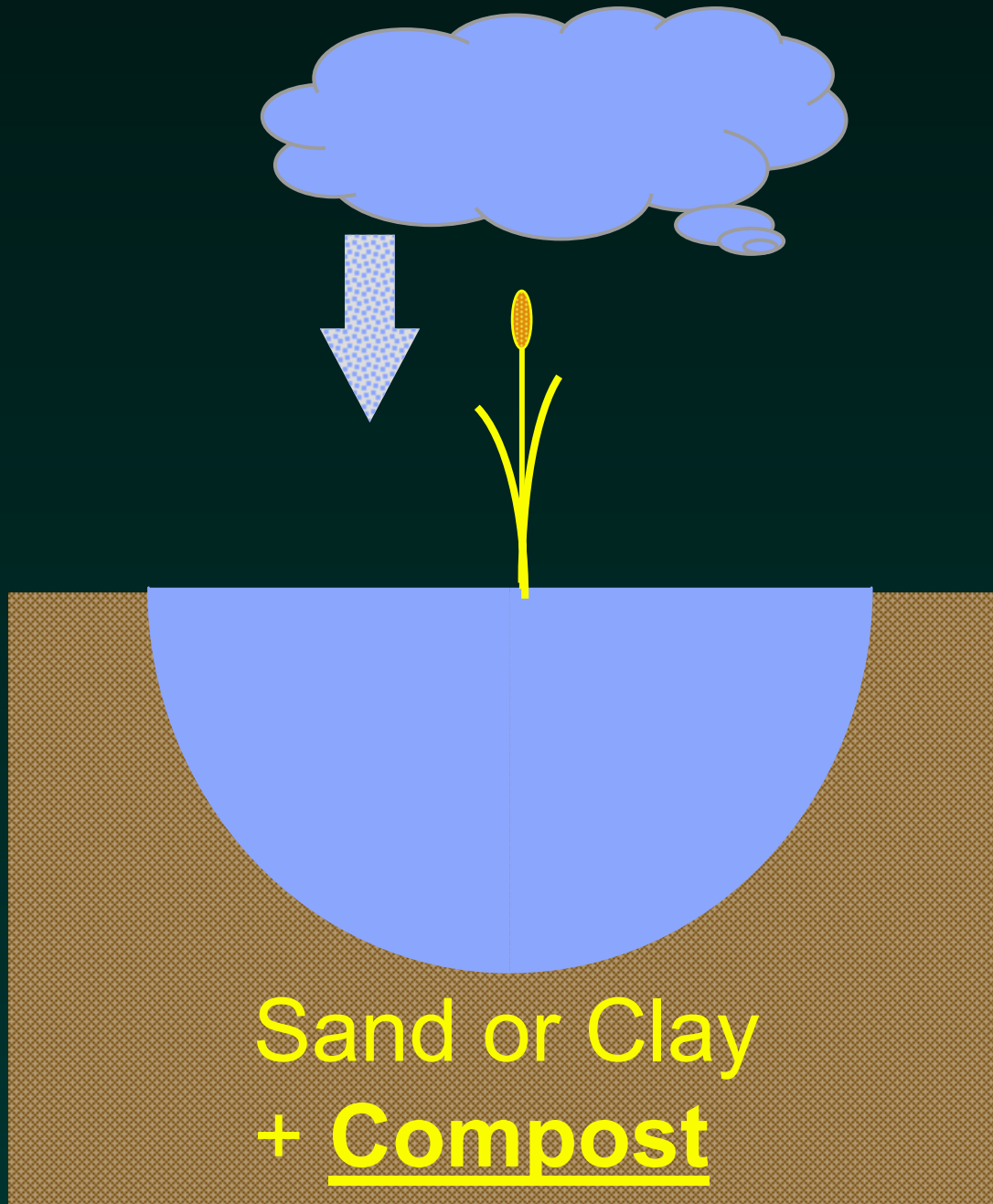
What Does Compost Do?



From: *The Nature and Properties of Soils*, N. Brady





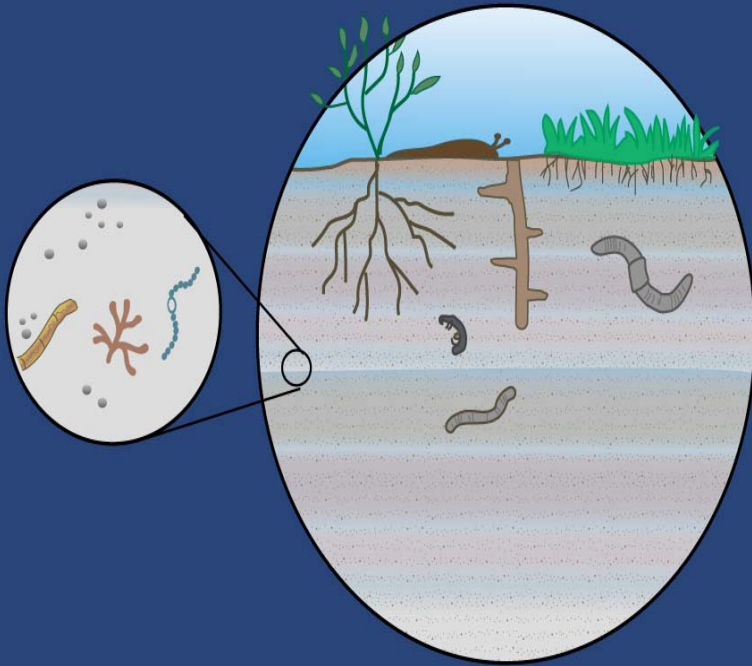


Utilization of best management practices for soils



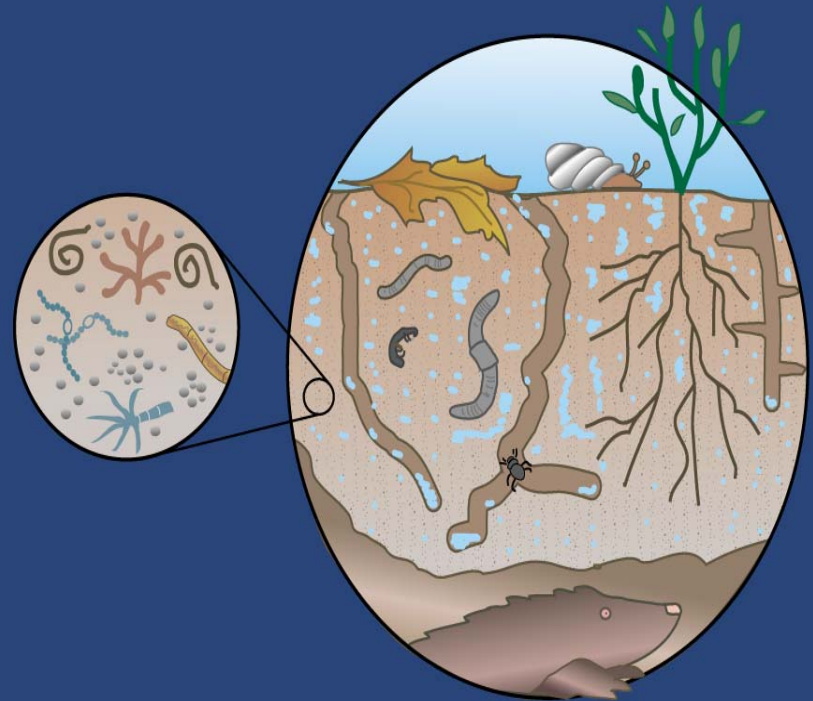
From: Soils for Salmon, City of Seattle/King County, WA

Magnified view of disturbed soil



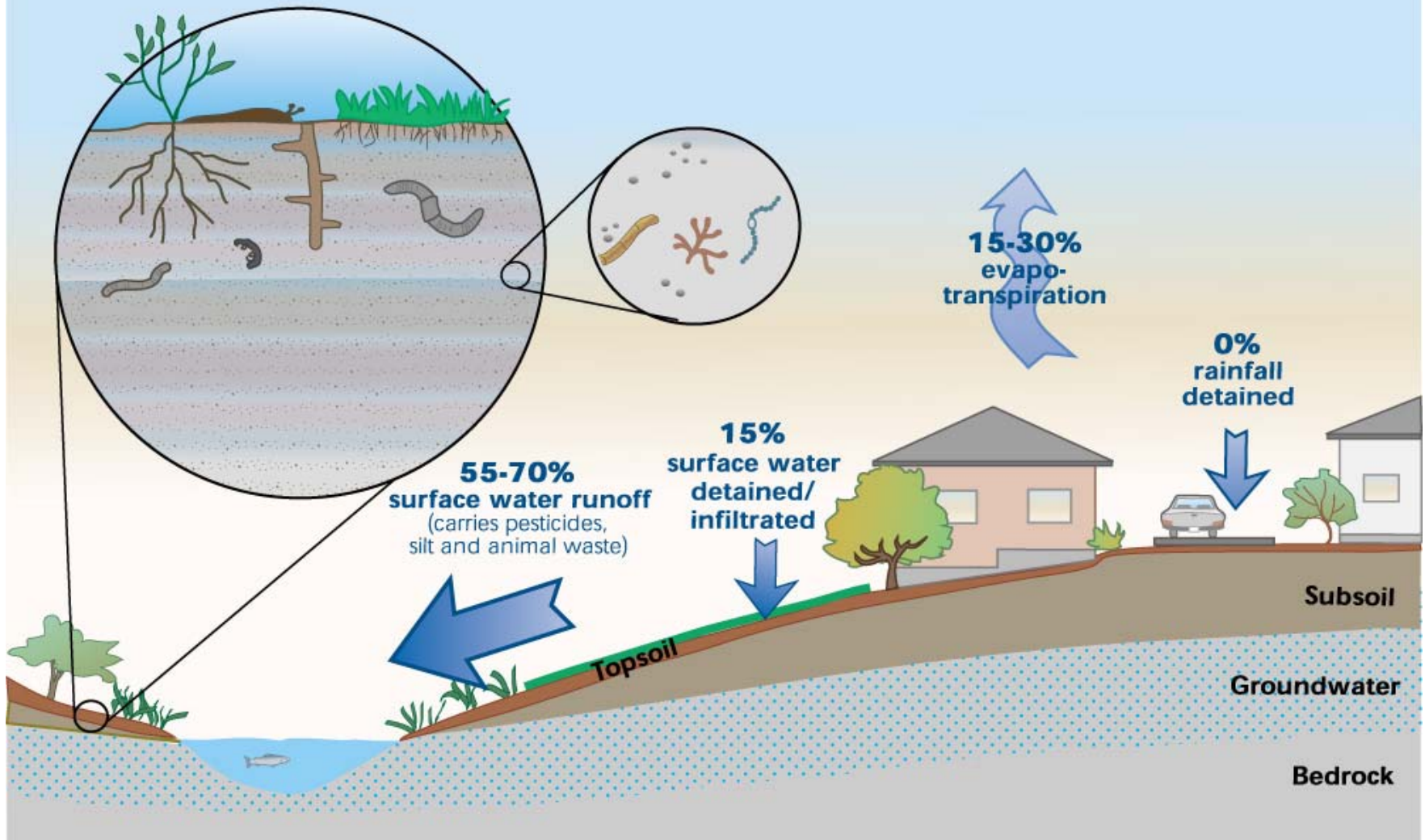
Compost-amended
soils mimic undisturbed
native soils

Magnified view of native soil



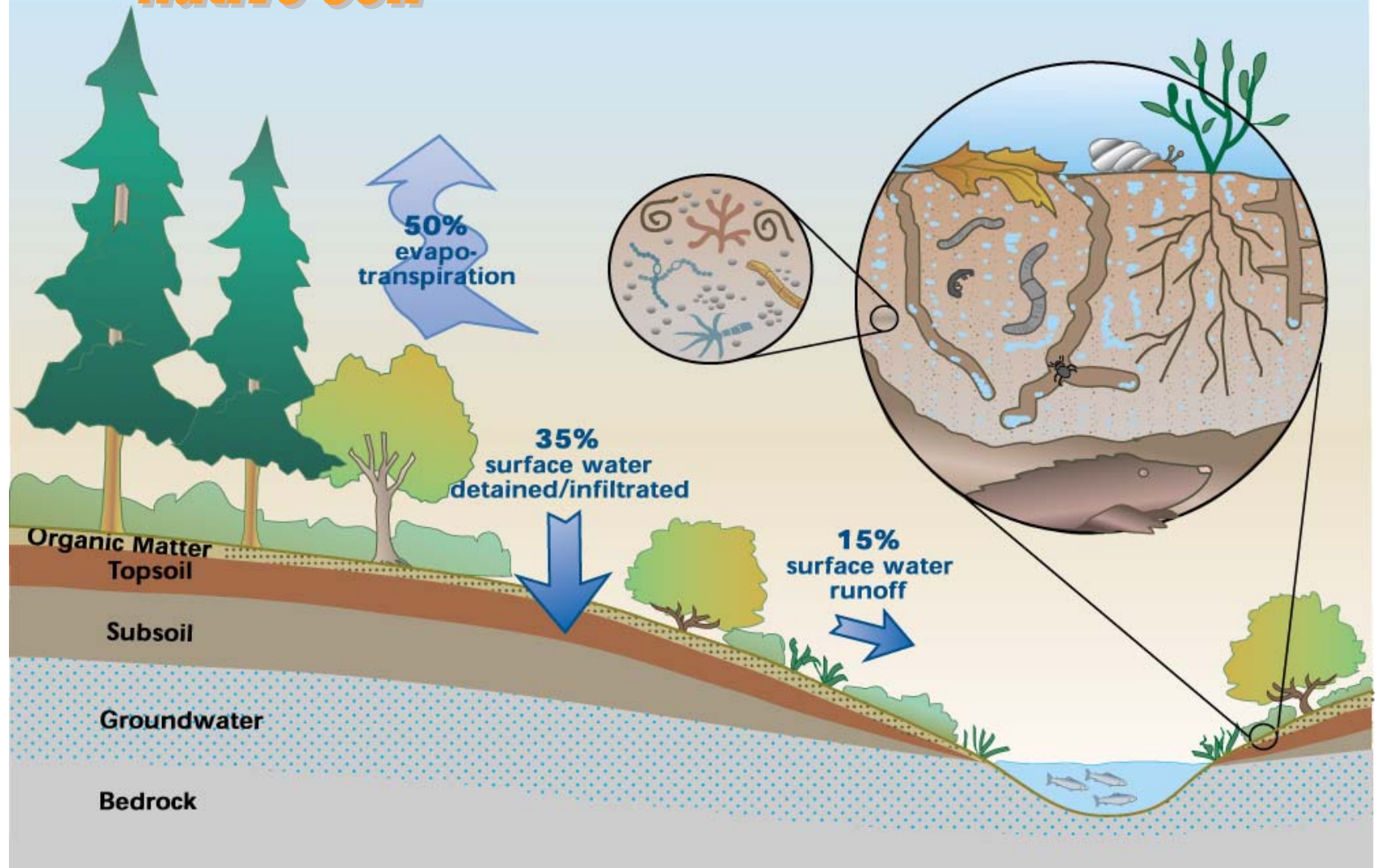
*From: Soils for Salmon, City of
Seattle/King County, WA*

Disturbed Soils- Urbanization



From: Soils for Salmon, City of Seattle/King County, WA

Native Soil



From: Soils for Salmon, City of Seattle/King County, WA

Water is Not the Entire Story

The Plants Play a Role

With compost -- roots cover greater volume. Access to more water even if % available is the same.



Soils in Colorado

- Typically have one percent organic matter
- Amending soil with one-inch of compost when planting a new lawn increases organic matter content to 5 percent
- One percent organic matter holds 35 —40 lbs of water (or 5 gallons)
- Five percent organic matter holds 175 —200 lbs of water (25 gallons)

Ordinances & Guidelines

- City of Redmond, WA: Final organic content of amended soil between 8 and 13% by soil weight
- City of Greeley, CO: New lawns will be allowed with the proper compost (at a rate of 4 cubic yards /1000 sq feet)

NPDES Phase II Requirements

ENTER COMPOST!!!

Compost Berm vs. Silt Fence

- 34 percent slope
- Yard trimmings compost
- Silt Fence: Total settleable solids in the water that passed through the silt fence was 32 ml/L and 26,000 ml/L respectively
- Compost berm: Total settleable solids in the water that passed through was 2.6 ml/L and 1,300 ml/L respectively.”
- Source: Bill Stewart, BioCycle, 1993 research



Traditional Silt Fence Application
US 281 Brownwood District 1/30/01



Compost Filter Berm
US 281 Brownwood District 1/30/01

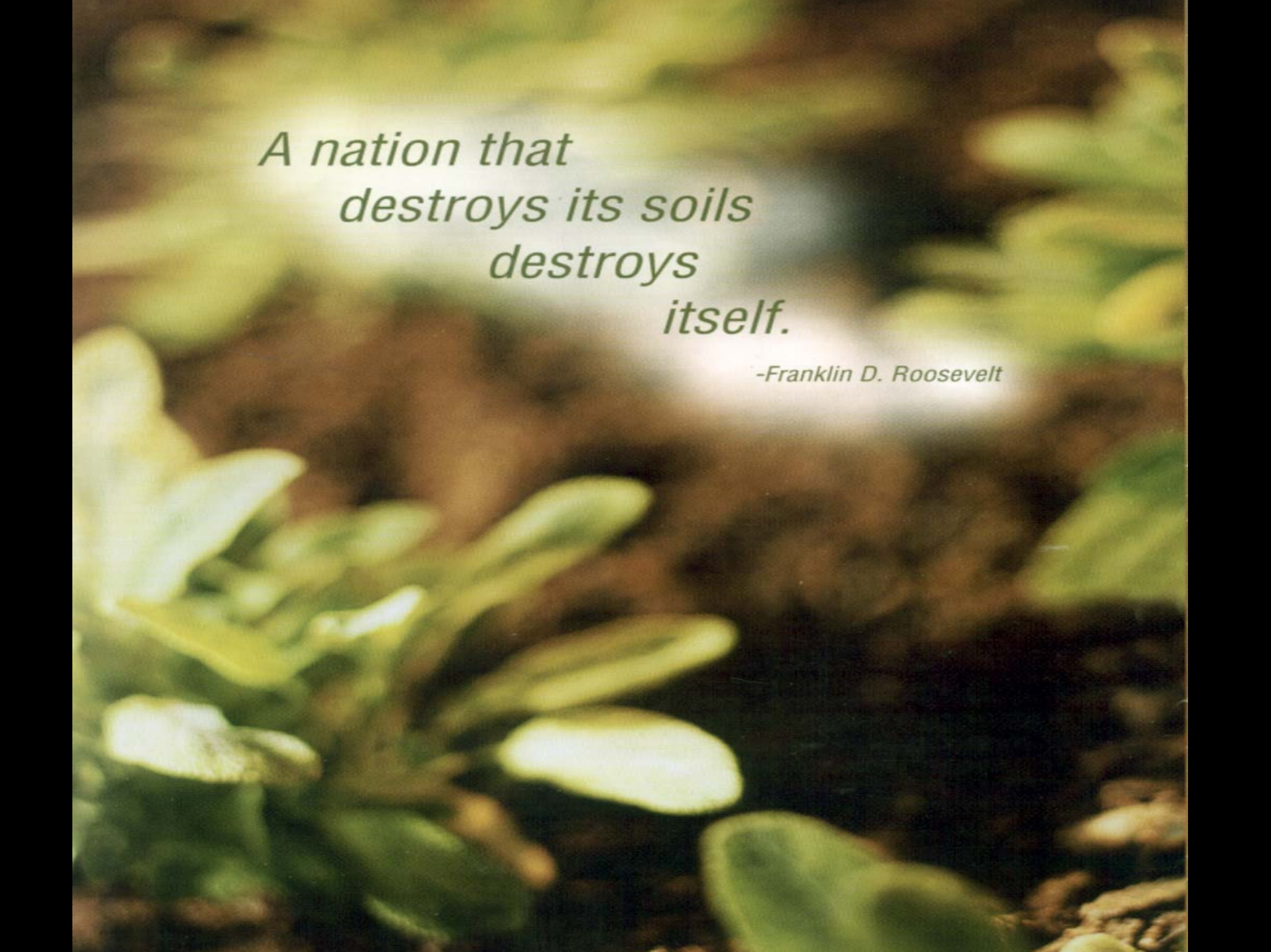
FOCUS ON MASSACHUSETTS

- Landfill tip fees: \$85 to \$100/ton
- Remaining landfill capacity: <2 years
- Regulatory environment: Tough but workable
- Diversion economics for generators:
FAVORABLE (e.g. \$10K - \$20K/store)
- Diversion economics for haulers: FAVORABLE
... With infrastructure, training
- Composting economics: FAVORABLE
With adequate throughput, good source
separation, strong markets

PARTING THOUGHTS ...

Consistent Product Quality





*A nation that
destroys its soils
destroys
itself.*

-Franklin D. Roosevelt